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Development Services Department  
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# Building Newsletter 17-2

## Special Inspection and Testing for Concrete and Shotcrete

Interpretations of State and Local Building Codes  
1994 Uniform Building Code: Chapter 17  
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### I. General

The purpose of this newsletter is to explain special inspection requirements for concrete and shotcrete work and to clarify the exceptions to those requirements provided in UBC Section 1701.5.1, exception 4, and exceptions to UBC Sections 1701.5.12, and 1922.11.2. These exceptions state that special inspection is not required for concrete or shotcrete site work, work fully supported on earth, minor repairs and where no special hazard exists. Examples of work which may qualify under these exceptions are; swimming pools, retaining walls, shoring, site work supported by earth, minor repairs, and work that poses no special hazards. Preconstruction tests required for shotcrete per UBC Section 1922.5 are also clarified in this newsletter.

### II. Definitions (For the purposes of this newsletter)

1. Erosion Control Device – An erosion control device is a piece of work artificially built up or composed of parts other than a building, shoring, retaining wall or planting material, that is designed and installed to control soil erosion on the face of a cut, fill or natural gradient.

Erosion control devices are regulated by the City of San Diego Planning Department and the Development Services Department, Engineering and Development Services Division.

Structures other than buildings in surface contact with a cut, fill or natural gradient with a slope greater than one and one half (1.5) horizontal to one (1.0) vertical shall be considered to be retaining walls or shoring unless a preliminary soils report prepared by a Geotechnical Engineer, or a Civil Engineer registered in the State of California demonstrate satisfactorily that the structure is an Erosion Control Device.

2. Fully Supported on Earth – Concrete or shotcrete that is supported by earth with a surface slope not exceeding 1 (one) vertical to 1-1/2 horizontal (34 degrees) is considered to be fully supported on earth.
3. Minor Repair
  - a. Repairs that do not require the replacement, removal or addition of any embedments, reinforcing steel, prestressed strands or tendons.
  - b. Repairs that do not exceed 1 cubic yard or 10% of the volume of an individual structural member, whichever is less, if so specified on the plans or repairs specified by the engineer of record.

4. Shotcrete – is mortar or concrete pneumatically projected at high velocity onto a surface. The process is also known by other proprietary names such as Guniting, Guncrete, Pneumcrete, Blastcrete, Blocrete and Jetcrete. It is applicable to the dry-mix and wet-mix processes using both fine and coarse aggregates.
5. Site Work – is work that is not an integral part of a permitted structure.
6. Special Hazard – Any condition or defects to the extent that, in the opinion of the Building Official, endanger life, limb, health, property or safety of the public.
7. Special Inspection – Continuous special inspection means that the special inspector is on the site at all times observing the work requiring special inspection.
8. UBC, Uniform Building Code

### III. Preconstruction Tests For Shotcrete Work

1. A preconstruction test panel must be designed, constructed, shot, cured, cored or sawn, examined, tested and approved prior to commencing the project when:
  - a. reinforcing bars larger than #5 are called out or
  - b. contact lap splicing of reinforcing bars are specified or
  - c. the minimum clearance between parallel bars as required by UBC Sec. 1922.4 is not provided and
  - d. when required by the building official.
2. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same nozzleman and with the same concrete mix design that will be used on the project.

It is the responsibility of the engineer or architect of record to provide a detailed drawing of the test panel that complies with UBC Sec. 1922.5.

#### **Exception:**

When the specified compressive strength ( $f'_c$ ) of the shotcrete is 2500 psi or less, the engineer or architect of record may, at his/her discretion, specify on the plans that preconstruction tests are not required.

### IV. Special Inspection Requirements

1. Continuous special inspection is required for concrete or shotcrete construction during the taking of test specimens, placement of reinforcement, placing

concrete and shotcreting. Examples of such structures are; swimming pools, retaining walls and cast in place drilled piles or caissons.

2. Special Inspection is not required for:

- a. Site work concrete or shotcrete fully supported on earth such as construction of paving, walkways, drainage swales, erosion control and non-structural slabs on grade.
  - b. Minor Repairs.
  - c. Concrete and/or shotcrete with a design strength ( $f'_c$ ) not exceeding 2500 psi.
  - d. When in the opinion of the building official, no special hazard exists.
  - e. When specified by the engineer of record and approved by the building official.
3. Special inspections must be performed by special inspectors certified by the Field Inspection Services Division of the Development Services Department. A list of certified special inspectors is available for review in the office of Field Inspection Services.

4. Testing Laboratories and agencies must be approved by the Field Inspection Services Division of the Development Services Department. A list of approved testing laboratories or agencies is available upon request.

**V. Visual Examination For Structural Soundness Of In-Place Shotcrete**

Completed shotcrete work shall be checked visually for reinforcing bar embedment, voids, rock pockets, sand streaks and similar deficiencies by examining a minimum of three 3-inch (76 mm) cores taken from three areas chosen by the design engineer of record which represent the worst congestion of reinforcing bars occurring in the project. Extra reinforcing bars may be added to noncongested areas and cores may be taken from these areas. The cores shall be examined by the special inspector and a report submitted to the building official prior to final approval of the shotcrete.

**Exception:**

Shotcrete work fully supported on earth, minor repairs, and when, in the opinion of the building official, no special hazard exists.